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| 10/801,997 | 03/16/2004 | William J. Begley | 87887AEK | 3335 |

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| EXAMINER | |
|---|---|
| GARRETT, DAWN L | |

| ART UNIT | PAPER NUMBER |
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| 1794 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/801,997 | BEGLEY ET AL. | |
| | Examiner | Art Unit | |
| | Dawn Garrett | 1794 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *25 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-9,12-17,19-22,24-47 and 49-52* is/are pending in the application.

4a) Of the above claim(s) *2-9,12-14 and 26* is/are withdrawn from consideration.

5)☒ Claim(s) *21 and 22* is/are allowed.

6)☒ Claim(s) *1,13-17,19,20,24,25,27-33,35-47 and 49* is/are rejected.

7)☒ Claim(s) *34 and 50-52* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

1. This Office action is responsive to applicant's responses filed March 12, 2008 and March 25, 2008. Claims 1 and 39 were amended. Claims 10, 11, 18, 23, and 48 are canceled. Claims 1-9, 12-17, 19-22, 24-47, and 49-52 are pending.

The prior rubrene species under consideration is considered allowable for a light emitting device comprising the specific components as required in the current claims. The previously considered species is the following: Naphthacene compound of Formula I where R2 and R4 are aryl and R1, R3, R5, and R6 are alkyl and with the ultimate species = Inv 2 at page 15.

As the next considered species, the examiner has selected the following:

Formula I wherein each of R1 to R4 is alkyl. R5 and R6 are non-substituted (e and f are zero).

Claims 1, 15-17, 19-22, 24, 25, 27-47, and 49-52 read upon the species. Claims 2-9, 12-14, and 26 are withdrawn as containing non-elected species.

2. It is suggested in claim 22 that the second "and" set be deleted [at the bottom of page 33 of the claim set dated 3/12/08].

3. The objections set forth in the last Office action (mailed December 14, 2007), paragraph 2, are withdrawn due to the amendment and applicant's remarks.

4. The rejection of claims 1, 6-8, 13-18, 24-33, 41, 42, 46 and 47 under 35 U.S.C. 103(a) as being unpatentable over Matsuura et al. (US 5,503,910) in view of Sato et al. (JP 04-335087) as set forth in the last Office action is withdrawn.

5. The rejection of claims 1, 6-8, 13-18, 24-33, 41, 42, 46 and 47 under 35 U.S.C. 103(a) as being unpatentable over Matsuura et al. (US 5,503,910) in view of Sato et al. (JP 04-335087) in view of Kobori et al. (US 6,285,039) as set forth in the last Office action is withdrawn.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 14 is again rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 comprises a formula Inv-21 that appears to be outside of the definition for the naphthacene derivatives of parent claim 1. Inv-21 comprises both a $CF_3$ and F substituent on the same phenyl ring. Formula (I) does not appear to allow for "$R_4$", for instance, to be two different substituents. "$R_4$" may be contained in a number of 2, but two substituents, if present, should be the same group.

Formula I is understood to include individually selected substitutents R1, R2, R3, R4, R5, and R6. The formula does not include different groups within each individual variable such as R1. For example, R1 can not be both $CF_3$ and F simultaneously.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1, 13-17, 19-20, 24, 25, 27-33, 35-44, 46, 47 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuura et al. (US 5,503,910) in view of Sato et al. (JP 04-335087) in further view of Kobori et al. (US 6,285,039).

Matsuura teaches organic light emitting devices having first and second emitting layers (see abstract). Matsuura teaches a bluish layer and a reddish/yellow layer (see col. 3, lines 11-19). There may be a layer with a hole transporting material and may emit in the 580nm to 650nm range per the "hole transporting layer" (see col. 3, lines 20-28). The reference teaches rubrene as a dopant (see col.61, bottom compound). The device further includes an electron transporting layer (see col. 66, lines 49-56). The blue layer may comprise a disytryl compound as a dopant (see examples and Table 1).

Per claims 15-17, the amount of rubrene compound used in the layer is 0.1-10 mol % (see col. 61, lines 54-58).

The layer comprising the reddish emitting compound (which can by hole transporting as set forth above) is around 40 nm in thickness (see col. 67, lines 35-37) per claim 24.

Per claim 25, a further hole transporting layer may be formed (see Examples, col. 67, lines 19-31).

Per claim 27, the second light emitting layer is around 20 nm in thickness (see col. 67, lines 48-49).

Per claim 28 a hole injecting layer may be formed (see col. 64, lines 21-33).

Per claim 29, CuPc may be included (see col. 65, lines 30-40).

Per claim 30, the thickness may be 1 nm to 10 micrometers (see col. 66, lines 4-6).

Per claim 31, the electron transporting layer may be 1 nm to 10 micrometers (see col. 66, lines 54-56).

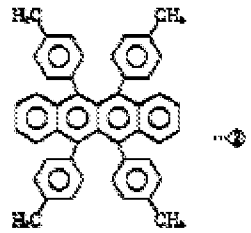
Per claim 32, magnesium and silver alloy cathodes are taught (see col. 68, lines 2-3).

Per claim 33, the cathode may be transparent (see col. 63, lines 17-20).

Per claims 41 and 47, there may be a layer of metal phthalocyanines adjacent the cathode (see col. 66, lines 39-41). Per claim 42, the thickness of such a layer is 1 nm to 10 micrometers (see col. 66, lines 54-56).

Per claim 46, hole transporting material includes arylamines (see col. 64, lines 34-55).

Matsuura is silent with respect to the specific rubrene species currently under consideration, but does teach compounds such as rubrene are appropriate. Sato teaches in analogous art light emitting naphthacene derivatives of the following formula for an EL device:



(see page 5 of JP patent document and abstract; same as instant formula I wherein R1-R4 are methyl).

It would have been obvious to one of ordinary skill in the art to have formed the Matsuura device using the rubrene derivatives taught by Sato in place of the rubrene taught in Matsuura, because one would expect the rubrene derivatives to be similarly useful as a light emitting material for the Matsuura device.

Matsuura et al. is silent with respect to including a green light emitting layer per claims 35-40. Kobori et al. teaches in analogous art the inclusion of a light emitting layer comprising a

coumarin or quinacridone derivative in order to achieve a multi-color emission device (see abstract, top of column 40, col. 25-26, col. 17-18). Matsuura et al. also is silent with respect to including a color filter per instant claims 43 and 44. Kobori et al. teaches addition of a color filter in a device may optimize the extraction efficiency and color purity (see col. 33, lines 53-56). Matsuura et al. is also silent with respect to adding additional dopants per instant claim 49. Kobori et al. teaches at least two dopants may be contained in a light emitting layer to provide a multi-color emitting device (see abstract). Matsuura is silent with respect to perylene derivatives for a blue layer. With respect to claims 1, 19 and 20, Kobori teaches the inclusion of known perylene derivatives (see col. 21, lines 21-24). With respect to claim 20, it would be obvious to add alkyl substituents to perylene, because one would not expect the alkyl substitution to affect the functionality of the perylene skeleton significantly. It would have been obvious to one of ordinary skill in the art to have incorporated a green emitting layer, perylene derivative dopants, color filter and/or multiple dopants in the Matsuura et al. device, because Kobori et al. teaches it is known in the art to add these features in order to achieve a device emitting of a desired color with a predictable result.

10. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuura et al. (US 5,503,910) in view of Sato et al. (JP 04-335087) in further view of Kobori et al. (US 6,285,039) in further view of Yamauchi et al. (US 5,640,067). Matsuura et al., Sato et al. and Kobori are relied upon as set forth above, but do not appear to mention a thin film transistor for use with the EL devices. Yamauchi et al. teaches thin film transistors for use with electroluminescent devices for controlling current applied to EL elements. It would have been obvious to one of ordinary skill in the art at the time of the invention to have incorporated a TFT

in the Matsuura et al. device, because one would expect the TFT to be similarly beneficial in controlling the current applied to the EL device.

***Terminal Disclaimer***

11. The terminal disclaimer filed on March 12, 2008 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. application no. 10/897,357 and U.S. patent no. 7,288,330 has been reviewed and is accepted. The terminal disclaimer has been recorded.

12. The previous double patenting rejections set forth in the last Office action are withdrawn due to the terminal disclaimer.

***Allowable Subject Matter***

13. Claims 21 and 22 are allowed. Claims 34 and 50-52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims if the double patenting rejections are overcome. The closest prior art, Matsuura (discussed above), fails to teach the limitations of these claims in combination with the other required limitations.

***Response to Arguments***

14. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

With respect to the prior 35 U.S.C. 112, second paragraph rejection over claim 14, applicant argues the language is clear. The examiner has maintained the rejection for the reasons set forth in this Office action.

The 132 Declaration submitted March 25, 2008 has been reviewed, but is not considered persuasive to overcome the current rejection over the new rubrene derivative species under consideration. The declaration is directed to experiments using rubrene derivative Inv-2.

With regard to applicant's arguments over Sato, the reference is relied upon to teach specific rubrene derivatives for a device. The primary reference, Matsuura, teaches a white light emitting device with a blue emitting layer. Kobori is relied upon to teach specific dopants and a filter for a device. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

***Conclusion***

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dawn Garrett whose telephone number is (571) 272-1523. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on (571) 272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dawn Garrett/
Primary Examiner, Art Unit 1794